

IDAHO DEPARTMENT OF FISH AND GAME

Jerry M. Conley, Director

HAGERMAN FISH DISEASE LABORATORY

Annual Report



1 October 1982 - 30 September 1983

by
Harold Ramsey
Fishery Pathologist

November 1984

TABLE OF CONTENTS

	<u>Page</u>
 <u>Job I</u>	
ABSTRACT	1
OBJECTIVES	2
RECOMMENDATIONS	2
INTRODUCTION	2
TECHNIQUES USED	4
FINDINGS	4
IMMUNIZATIONS	4
 <u>Job II</u>	
ABSTRACT	8
OBJECTIVES	9
RECOMMENDATIONS	9
TECHNIQUES USED	9
FINDINGS	10
DISCUSSION	10

LIST OF TABLES

Table 1. Major pathogens isolated at Idaho Fish and Game hatcheries	5
Table 2. Exams and findings from non-Fish and Game hatcheries	6
Table 3. Maximum settleable solid concentrations (mI/I) at Idaho hatcheries, 1 October 1982 to 30 September 1983	13
Table 4. Maximum suspended solid concentrations (mg/i) at Idaho hatcheries, 1 October 1982 to 30 September 1983	14
Table 5. Hatchery flows (cfs) at Idaho hatcheries, 1 October 1982 to 30 September 1983	15

LIST OF FIGURES

	<u>Page</u>
Figure 1. Idaho Fish and Game hatcheries	3
Figure 2. Maximum concentrations attained for settleable and suspended solids during 1 October 1982 - 30 September 1983 at American Falls, Ashton, Clark Fork, Eagle, Grace, Hagerman and Hayspur hatcheries (settleable solids, ml/l, in left bar and suspended solids, mg/l, in right bar)	11
Figure 3. Maximum concentrations attained for settleable and suspended solids during 1 October 1982 - 30 September 1983 at Mackay, Magic Valley, McCall, Nampa, Niagara Springs and Rapid River hatcheries (settleable solids, ml/l, in left bar and suspended solids, mg/l, in right bar)	12

HAGERMAN FISH DISEASE LABORATORY

Job I

ABSTRACT

During the period of this report (1 October 1982 to 30 September 1983), I visited most state hatcheries at least once to observe fish condition, health and general hatchery practices. In addition, I responded to approximately 131 requests for diagnostic services to determine causes of excessive fish mortalities. Various diseases were diagnosed and appropriate treatments recommended. Also, trips were made to several hatcheries for tissue and ovarian fluid sampling to determine the status of viral diseases.

Author:

Harold Ramsey
Fishery Pathologist

OBJECTIVES

To monitor diseases and general health of fish at the 18 fish cultural installations operated by the Idaho Department of Fish and Game and prescribe treatment, if necessary.

To diagnose unknown diseases at hatcheries and to prescribe prophylactic disease control measures or medicines to effect cures.

To assist hatchery personnel in any way necessary to achieve the best finished product possible.

RECOMMENDATIONS

The Department should continue to insure that all hatcheries receive publications that are applicable to fish culture, such as "The Progressive Fish Culturist," and are well informed on fish health prevention, control and management techniques.

The Department should continue to sponsor meetings and orientations for all hatchery personnel as they relate to fish culture to keep workers aware of new innovations and techniques in this field.

An effort should be made to determine optimum loadings at each hatchery and attempt not to jeopardize fish health by exceeding these densities.

An effort should also be made to determine if there is a correlation between the outbreaks of certain diseases at each hatchery with seasons of the year.

INTRODUCTION

The Idaho Department of Fish and Game operates 18 fish hatcheries, rearing ponds and redistribution facilities which annually produce about 1 to 1.5 million pounds of fish (Fig. 1).

The project leader usually visits each hatchery at least once per year to routinely examine their fish for disease and general health. He is also available on an as needed basis. If a disease is encountered it is diagnosed and steps for a cure are prescribed. Hatchery management practices are also evaluated as they relate to fish health.

The project leader is on call to make an emergency call to any hatchery that develops a disease problem during the year.

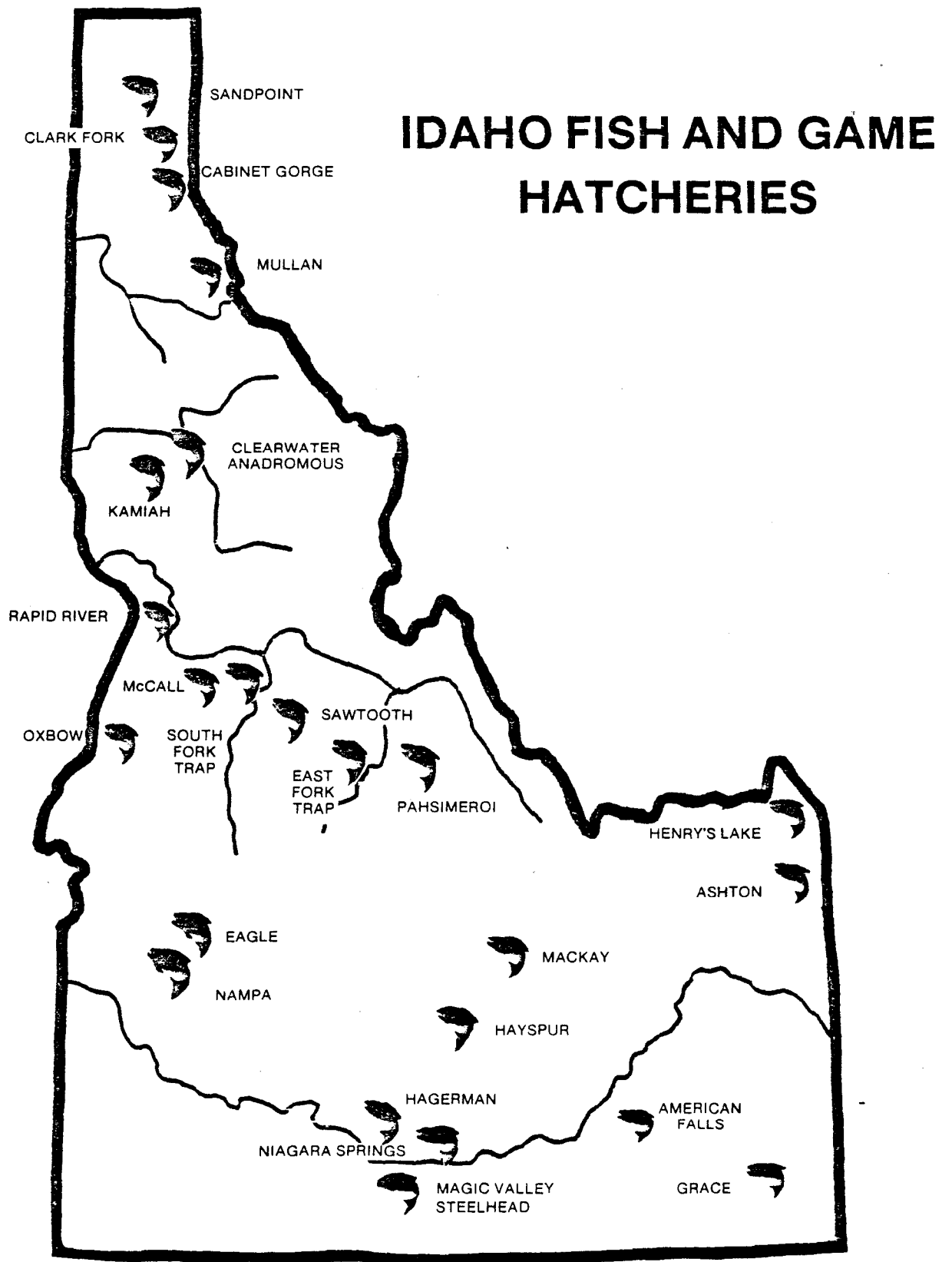


Figure 1. Idaho Fish and Game hatcheries.

The Department purchases a portion of their fish and fish eggs from other states or commercial sources. The project leader should inspect these eggs and fish for disease prior to acceptance by the Department.

Fish feed samples are taken and may be analyzed for nutrient values and quality control.

Water supplies are frequently analyzed for chemical characteristics.

TECHNIQUES USED

The Department maintains a small laboratory at the Hagerman Hatchery. This laboratory is equipped to provide facilities and support services where most fish diagnostic work can be accomplished.

Necropsy procedures and diagnoses are based on standard methods established by the Fish Health Section of the American Fisheries Society and publications of research workers. Occasionally, assistance is given by other state, federal and private laboratories. Occasionally, dual infections are present and no attempt is made to isolate individual species if treatment is the same for both species.

FINDINGS

There were approximately 131 requests for diagnostic services to determine causes of excessive fish mortalities at state hatcheries from 1 October 1982 to 30 September 1983. There were additional examinations made on fish at nonstate hatcheries or other water supplies. All of these calls were for major problems and did not include minor examinations or managerial and environmental problems. There were also a number of visits for sampling of tissues and ovarian fluids for virology and these are included. Many of the problems required more than one visit, and in some cases, diseases recurred at a later date.

A summary of findings follows in Tables 1 and 2.

IMMUNIZATIONS

The Department has continued with the program to vaccinate rainbow trout at stations with a history of enteric red-mouth disease (ERM). Fish are immunized with bid contract bacterin using a shower apparatus when fish are about 30 per pound. All hold-over rainbows at American Falls, Eagle, Hagerman and Nampa are immunized, and to date, no outbreaks of ERM have occurred.

Table 1. Major pathogens isolated at Idaho Fish and Game hatcheries.

Hatchery	No. of visits	No. of exams	virus	systemic bacteria	Gill bacteria	External parasites	Internal parasites	other
American Falls	2	0						
Ashton	0	4		2	1	2	1	
Clark Fork	0	4	IPN-2	2	1	3		Nutritional-2
Eagle	4	7	Neg-2	4	1		2	Nutritional-1 & possible environmental
Grace	2	6	IPN-1	4	3	3	1	
Hagerman	Many	13	IPN-4 IHN-6	2	4	4	PKD-2	Nutritional, ammonia, fungus
Hayspur	2	5	Nag-1	1	2	4		
Hayden Creek	0	slides-1			1			
Mackay	1	7	Neg-2	1	3			Nutritional, coagulated yolk
Magic Valley Steelhead	9	16	IPN-9	6	6	4	1	Fungus
McCall	2	4	Nag-6	OKD-2 other-1	1	4		Nutritional
Nampa	5	18	IHN-8 IPN-4	Other -5 ERM-4	2		1	
Niagara Springs	13	26	IHN-4 IPN--4	5	5	3	1	Nutritional-2
Oxbow	0	1	Neg for IHN-1					
Pahsimeroi	3	3	IPN>Ad IHN					Possible nutritional
Rapid River	1	5	IHN-Ad					

Above are listed known pathogens and problems occurring at state hatcheries, usually causing mortalities. Table 1 shows only occurrences of pathogens and not frequency or recurrences. Occasionally dual infections are present and no attempt was made to isolate individual species if treatments were the same for both species.

Table 2. Exams and findings from non-Fish and Game hatcheries.

Hatchery or location	No. of visits	No. of exams	Virus	Systemic bacteria	Gill bacteria	External parasites	Internal parasites	Other__.
Anderson Ranch Reservoir		2	Neg.-2					
Batiste Springs	2	1			1	1		Strawberry Disease
Bliss Dam	1	1	(7.5 foot female sturgeon killed by power boat.)					
Hagerman National	3	3		BKD-1 Other-1	Routine exam evaluating differences in fish between regular feeding regime and demand feeders (10 raceways).			
Leetown		1				PKD-1		Live box fish when infected with PKD to be sent to Leetown.
Leo Ray Trout	1	3		ERM-3		Gyros-3		
Paddock Reservoir		1		1	(Crappies sent to determine cause of mortalities.)			

Vibrio vaccinations at Niagara Springs, Rapid River and McCall have been discontinued. It has been determined that these immunizations do not return any greater number of spawning adults to the state.

HAGERMAN FISH DISEASE LABORATORY

Job II

ABSTRACT

In compliance with the provisions of the Federal Water Pollution Control Act, fish hatcheries are authorized to discharge, under the National Pollutant Discharge Elimination System (NPDES), a restricted amount of settleable solids to receiving waters. Monitoring of these and other parameters is required. Removal of settleable solids is needed to achieve final limits of permit. Reports of findings and data storage are also required by federal laws. During the period 1 October 1982 to 30 September 1983, we monitored effluent discharges at the 13 state fish hatcheries that fall under these criteria.

Author:

Harold Ramsey
Fishery Pathologist

OBJECTIVES

To monitor the effluent from 13 state fish hatcheries to insure that their effluent meets limitations imposed by the Environmental Protection Agency (EPA) through National Pollutant Discharge Elimination System (NPDES) permits.

RECOMMENDATIONS

Continue monitoring hatchery effluents.

Complete construction of settling systems where needed.

Continue participation with EPA and others for the development of current, fair and equitable permits.

TECHNIQUES USED

The Environmental Protection Agency (EPA) requires pollutant discharge permits for fish hatcheries which produce 20,000 pounds of fish or more during the year.

The Idaho Department of Fish and Game currently operates 13 fish hatcheries which require permits: American Falls, Ashton, Clark Fork, Eagle, Grace, Hagerman, Hayspur, Mackay, Magic Valley, McCall, Nampa, Niagara Springs*, Pahsimeroi* and Rapid River*.

Parameters required by permits include settleable solids, suspended solids and water flows. Frequencies of samples and sample types vary from station to station, but generally are taken on a weekly basis. Samples are taken on incoming waters, outflows and during cleaning and noncleaning situations.

Filters from each hatchery are analyzed by a commercial laboratory, and results are recorded and filed. Laboratory costs are billed to the individual hatcheries.

Monthly reports from the hatcheries are recorded and Discharge Monitoring Reports (DMR) are submitted to EPA monthly.

If violations occur, additional written communication is filed to EPA stating nature of violation, causes and steps taken to prevent a reoccurrence.

Techniques are based primarily on established procedures set forth by "Standard Methods for Examination of Water and Wastewater" and EPA methodologies.

*Idaho Power Company owned.

In accordance with NPDES permits, water samples are checked for concentrations of settleable solids and suspended solids. Settleable solids are measured in an Imhoff cone and readings are taken on material settled out after one hour. Suspended solids are determined by filtering sample through preweighed filters, oven-dried and again weighed to obtain net gain.

FINDINGS

We found that all readings for settleable and suspended solids fell within the limits of the permits during normal hatchery operations. However, during cleaning operations, settleable solids may exceed limitations if no settling facility is present.

Compilation of settleable and suspended solid concentrations is presented in Tables 1 and 2, as well as in Figures 2 and 3. Flows in cubic feet per second (cfs) are presented for each hatchery in Table 3.

DISCUSSION

Permits to discharge expired for all state hatcheries on December 31, 1979. Since that time, state hatcheries have continued to sample their effluents and reports to EPA have continued as if we had valid permits.

In late November, 1982, EPA informed fish producers that we would be conforming to new temporary permits until new permanent permits could be issued with the parameters EPA thought pertinent. Parameters changed drastically and permittees were dismayed at the way EPA instigated the new changes and permits.

During the last year, there have been numerous meetings with various parties concerned about hatchery discharges. These include representatives from hatcheries at the commercial, federal and state levels as well as EPA, Idaho Health and welfare, environmentalist groups and politicians.

Two studies have been completed during this period, one by the commercial industry and state and one by EPA contracting to a private firm. Another one by the same firm was tentatively established, but has not yet been started due to lack of EPA funds.

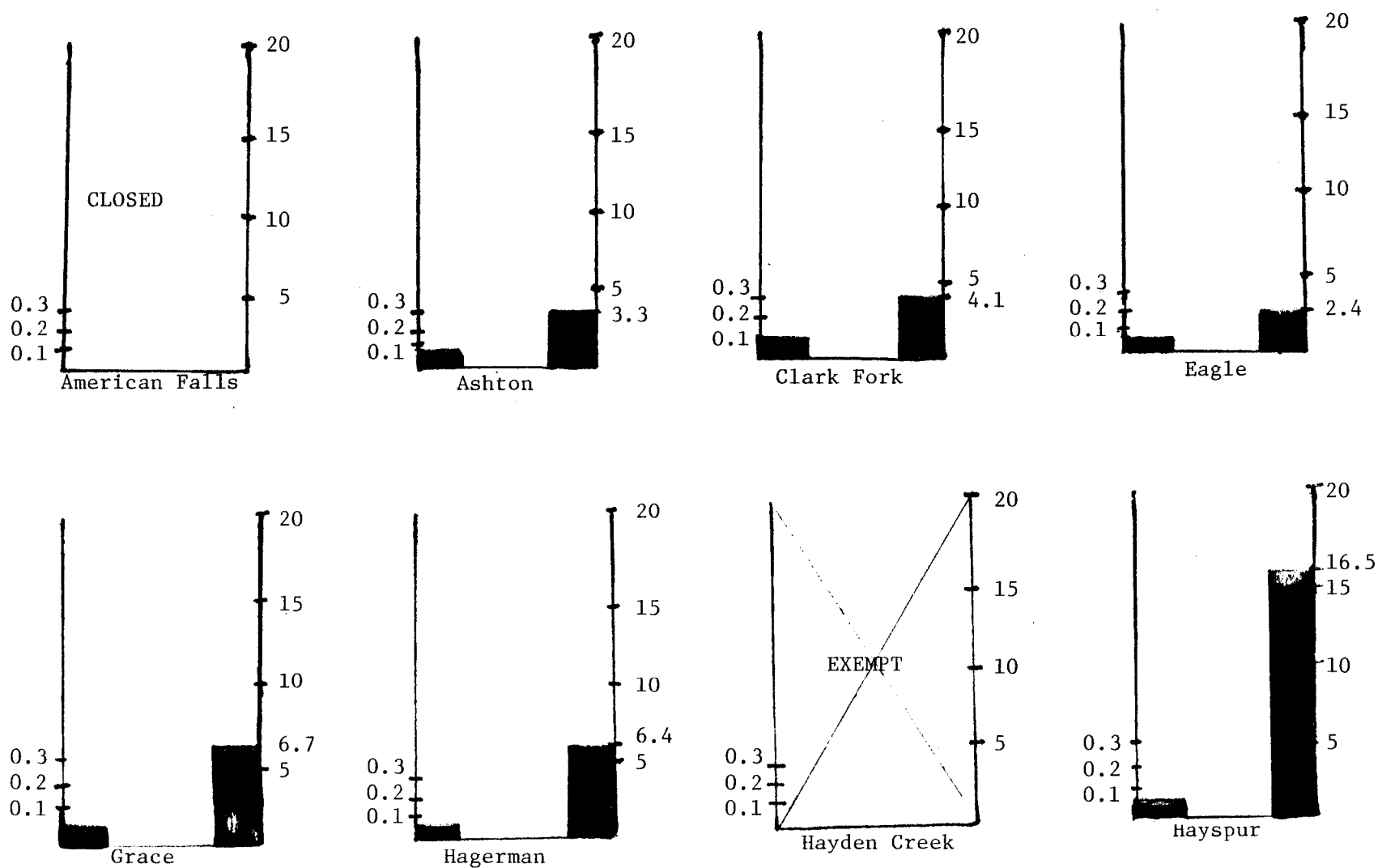


Figure 2. Maximum concentrations attained for settleable and suspended solids during 1 October 1982 - 30 September 1983 at American Falls, Ashton, Clark Fork, Eagle, Grace, Hagerman and Hayspur hatcheries (settleable solids, ml/l, in left bar and suspended solids, mg/l, in right bar).

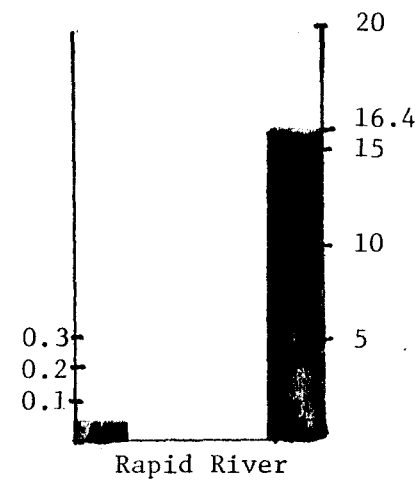
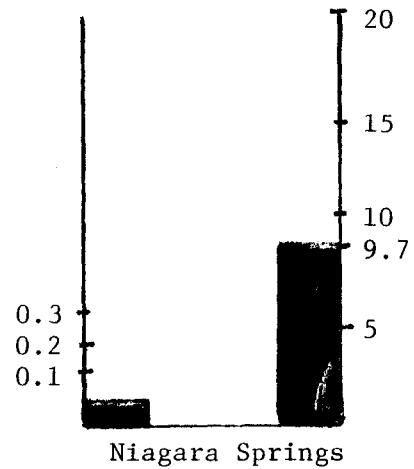
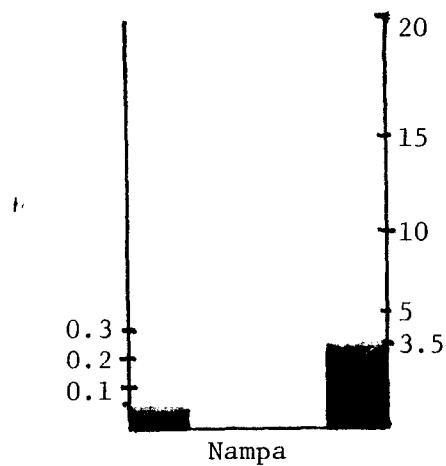
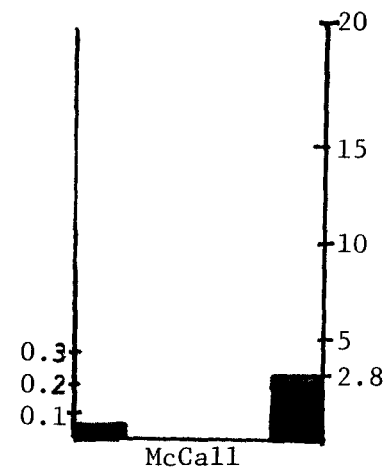
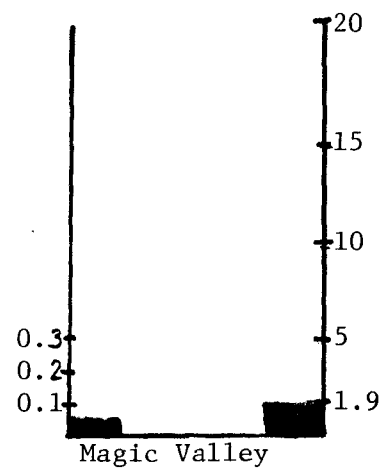
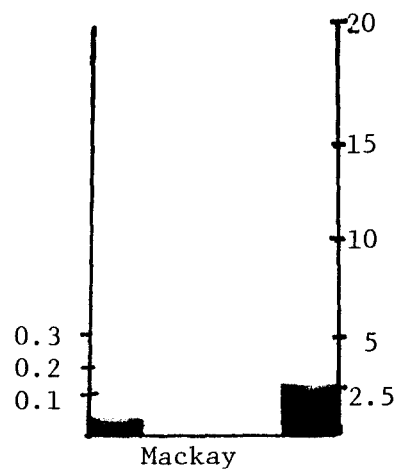


Figure 3. Maximum concentrations attained for settleable and suspended solids during 1 October 1982 - 30 September 1983 at Mackay, Magic Valley, McCall, Nampa, Niagara Springs and Rapid River hatcheries (settleable solids, ml/l, in left bar and suspended solids, mg/l, in right bar).

Table 3. Maximum settleable solid concentrations (ml/l) at Idaho hatcheries, 1 October 1982 to 30 September 1983.

Station	Settleable Solid Concentrations											
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
American Falls	Closed for reconstruction											
Ashton	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Clark Fork	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Eagle	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Grace	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Hagerman	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Hayspur	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Mackay	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Magic Valley					<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
McCall					<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nampa	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Niagara Springs*	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Rapid River*	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

*Idaho Power Company owned.

Table 4. Maximum suspended solid concentrations (mg/l) at Idaho hatcheries, 1 October 1982 to 30 September 1983.

Station	Suspended Solid Concentrations										
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Sep
American Falls	Closed for reconstruction										
Ashton	2.1	0.5	2.1	1.8	2.8	1.6	3.3	1.7	0.9	2.1	
Clark Fork	1.0	0.3	0.4	4.1	0.3	2.0	0.7				
Eagle	0.7	1.1	2.4	0.4	2.2	0.4	0.8				
Grace	2.4	6.7	2.4	2.3	5.5	3.5	2.2				
Hagerman	2.7	2.3	6.4	4.6	4.6	2.2	4.0				
Hayspur	1.4	2.1	3.1	7.4	6.5	8.9	16.5				
Mackay	2.3	2.5	0.7	0.7	1.2	1.8	0.2	0.5	2.4		
Magic Valley					0.3	0.5	0.1	1.9			
McCall					2.8	0.9	1.8				
Nampa	3.3	2.4	2.5	1.8	6.0	1.6	3.5	1.7	2.6		
Niagara Springs*	0.9	0.5	5.1	3.6	3.8	9.1	9.7	2.0	4.5	3.8	2.6
Rapid River*	2.7	2.4	5.8	2.7	4.5	16.4	0.9	3.5			1.8

*Idaho Power Company owned.

Table 5. Hatchery flows (cfs) at Idaho hatcheries, 1 October 1982 to 30 September 1983.

Station	Flow (cfs)											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
American Falls	Closed for reconstruction.											
Ashton	6	6	6	6	6	6	6	6	6	6	6	6
Clark Fork	6	6	8.6	8.6	8.6	9.4	13	11.4	11	11	12.4	12
Eagle	3	3	3	3	3.8	1.9	2.0	2.0	1.9	1.9	1.9	1.9
Grace	19.7	19.5	16.3	16.3	14.5	14	13.4	14.9	17.3	16.3	14.5	20.8
Hagerman	85	83	82	80.5	83.6	97.7	107.1	108	94.5	84	72	74.6
Hayspur	21.1	21.3	24.9	25.2	23.6	22.7	23.3	25.9	21.7	29.5	27.3	29.6
Mackay	22	22	22	22	22	22	24	24	24	25	24	25
Magic valley Sthd					32.7	34	30.9	0.1	3	5.8	5.8	11.9
McCall					20	20	20	6	20	20	20	20
Nampa	35	35	34	34	34	34	34	34	44	44	44	44
Niagara Springs*	65	87	90.1	87.3	86.7	88.1	87.8	9.3	8.8	10.1	58.8	70.6
Rapid River*	25	25	31.5	31.1	30.3	30.5	17.5	33	30.6	26	24.4	28